

ATTACHMENT A  
SUMMARY OF CLOSURE ACTIVITIES AT HWM1 AND AREA 8

**SUMMARY OF CLOSURE ASPECTS OF  
APPROVED CLOSURE AND  
POST CLOSURE PLANS  
HWM-1 AND AREA NO. 8 LANDFILLS**

**BETHLEHEM STEEL CORPORATION  
STEELTON PLANT**

*Prepared by*  
**BAKER/TSA, INC.  
CORAOPOLIS, PENNSYLVANIA**

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**SUMMARY OF CLOSURE ASPECTS OF  
APPROVED CLOSURE AND POST  
CLOSURE PLAN  
HWM-1 LANDFILL**

**BETHLEHEM STEEL CORPORATION  
STEELTON PLANT  
PAD003026531**

*Prepared by*  
**BAKER/TSA, INC.  
CORAOPOLIS, PENNSYLVANIA**

**MAY, 1986  
REVISED NOVEMBER, 1986  
With DER Approved Revisions Subsequent to  
November 1986 and Through January 1989**

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Bethlehem Steel Corporation (BSC) owns and operates the Steelton Plant located approximately one mile south of Harrisburg in Dauphin County, Pennsylvania. The Steelton Plant uses scrap metal to produce steel by the electric arc furnace (EAF) process. EAF dust is generated by three electric arc furnaces located in the steelmaking Melt Shop.

The HWM-1 Landfill is located in Swatara and Lower Swatara Townships entirely within the Steelton plant boundary adjacent to Steelton's active residual waste landfill. Access to the landfill is limited to several entrance gateways, all controlled by Bethlehem Steel Corporation. Presently HWM-1 contains approximately 300,000 cubic yards of EAF dust. The existing landfill is irregularly shaped and covers approximately 10.3 acres. Existing dust side slopes vary.

HWM-1 is not located within a 100-year floodplain as determined by the Federal Emergency Management Agency Flood Insurance Study (FIS) for the Township of Swatara dated August 3, 1981.

Based on the available subsurface information, most of the area contains fill materials (quarry overburden, slag and construction debris) overlying natural soils and carbonate bedrock which have modified the original site topography. The bedrock surface generally slopes from southwest to northeast beneath most of the HWM-1. The natural soils overlying the bedrock consist of the Hagerstown series which are residual sands, silts, and clays derived from the weathering of carbonate bedrock. These natural soils are classified as either SM (silty sands), SC (clayey sands), or CL (clay) soils according to the Unified Soil Classification System.

The Steelton Plant uses scrap to produce steel by the electric arc furnace process. The electric arc furnaces generate particulate emissions during the (1) charging of scrap and materials, (2) tapping of furnaces, (3) pneumatic injection of additives, (4) oxygen blowing and (5) meltdown/refining periods. This particulate (i.e., EAF dust) is collected in two baghouses.

The Steelton plant currently generates about 9,000 tons of EAF dust per year; approximately 22,000 tons per year are generated when the plant operates at full capacity. Until recently, the EAF dust was deposited in HWM-1. This facility stopped receiving EAF dust on December 31, 1985.

Dust and associated discarded materials from emission control facilities for electric arc furnaces (EAF) was the only waste disposed at HWM-1 landfill (approximately 300,000 cubic

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yards). EAF dust is a listed hazardous waste (K061) for the constituents of lead, cadmium, and chromium.

The average raw chemical composition of the Steelton Plant K061 EAF dust as determined by 62 separate analyses conducted over a six-year period is as follows:

<u>Primary Component</u>	<u>Percent by Dry Weight</u>
Iron	21.5
Calcium Oxide	16.6
Zinc	19.4
Lead	4.23
Cadmium	0.11

The average EP Toxicity extract concentrations for the plant's K061 EAF dust was determined from twelve separate EP Toxicity tests performed over a five-year period. The concentrations for constituents which failed the EP Toxicity Test are as follows:

<u>Steelton EAF Dust Constituent That Failed EP Toxicity Test</u>	<u>Average EP Toxicity Extract Concentration (mg/l)</u>
Lead	139.0
Cadmium	1.65

The plant's K061 EAF dust physical characteristics, based upon over 15 years of operating experience, are as listed:

- Physical State - Solid
- Average Bulk Density - 65 pounds/cubic foot
- Color - Reddish Brown
- Odor - None
- Free Liquids - None
- Non-ignitable
- Non-corrosive
- Non-reactive

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Other pertinent characteristics of Steelton plant EAF dust are as follows:

Description: Emission control dust from the electric furnace production of steel.

EPA Hazardous Waste Number: K061

### **CLOSURE ACTIVITIES**

HWM-1 will be closed as a landfill in accordance with 25 PA Code Chapter 75.264. Closure activities generally will consist of:

- Initial site preparation to reduce the lateral extent of the landfill,
- Cover installation,
- Erosion control,
- Equipment decontamination, and
- Implementation of security measures.

Installation of the cover will include run-on and run-off control and a suitable surface to promote vegetation and prevent erosion.

### **Site Preparation**

During site preparation, the 10.3 acre landfill site will be reduced by recontouring, excavating, consolidating and relocating waste material within HWM-1 to an area of approximately 7.5 acres. Where EAF dust is relocated, approximately one foot of soil and base material from beneath relocated portions of the waste will be excavated and placed within the landfill.

In the course of reconstructing and consolidating the landfill, after PADER approval of this Closure Plan, all material will be compacted to minimize settling. It is anticipated that the small amount of settlement that may occur will not adversely affect the landfill cover.

### **Cover Installation**

After site preparation is complete, the final cover will be installed and will consist of:

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- A one-foot-thick layer of low permeability soil placed over the entire consolidated HWM-1 landfill.
- A 16 ounce geotextile protective layer, unless DER agrees to delete same.
- A 50 mil geomembrane cover.
- A geonet drainage layer to provide drainage of infiltrated moisture.
- A 10 ounce geotextile to prevent clogging of the geonet drainage layer.
  
- A thirty-inch thick layer of soil placed over the geotextile as a surface cover to promote vegetative growth and provide frost protection. The first six inches may contain stones passing a six inch screen; the balance may contain stones passing a ten inch screen.
  
- Permanent vegetation of the final cover to prevent erosion.

Gas vents will not be provided since anaerobic biological production of gas is not expected within HWM-1 because no organic materials were placed in the landfill.

The landfill cover will be graded to a maximum 6.5H:1V (15%) slope.

The depth of cover material above the low permeability material is approximately 30 inches. This depth is greater than the 30 inches average frost depth at the location of the Steelton plant; therefore, frost will not affect the low permeability material or the geomembrane.

Groundwater monitoring was implemented prior to closure and will continue through the post-closure period.

An analysis of the proposed final cover design was performed using the EPA "Hydrologic Evaluation of Landfill Performance (HELP) Model" to determine the quantity of water that could be expected to percolate through the cover and the landfill. Soil parameters (such as field capacity, wilting point, etc.) for the various layers are assumed by the model based on soil texture/grain size and selected permeabilities.

Results from the model indicate an average annual total of 0.05 inches of water percolating from the base of the landfill and the base of the cover. This means that of the more than 43 inches of annual precipitation, less than 0.1 percent will infiltrate through the cover and the

waste. This demonstrates that the proposed cover effectively minimizes infiltration and resulting leachate generation.

A collection channel will be constructed around the upgradient perimeter of the landfill. This channel will collect run-on from upgradient areas and landfill runoff to prevent erosion damage to the base of the landfill. The channel will be "V" shaped with 2H:1V side slopes and will flow in a northwesterly direction on an approximately one percent slope. The downgradient sections of the channel are designed to accommodate runoff from both HWM-1 and adjacent areas to the west. The channel will be trapezoidal shaped with 2H:1V side slopes.

The collection channel is designed and will be constructed to carry the peak discharge from a 100-year, frequency storm event. Due to the relatively small contributing drainage area with resultant design discharge and shallow channel slope, permanent vegetation is sufficient to prevent erosion damage during storm events except where rock lining has been specified.

HWM-1 is located in an upland industrial disposal area with no natural drainage channels. As discussed previously, closure activities for this site will include waste regrading and cover installation. During closure, construction operations will be limited to an area of approximately eleven acres and to minimize erosion, disturbed areas will be vegetated as soon as possible after grading is complete. Runoff is expected to occur as sheet flow.

Temporary erosion control for closure will consist of a silt barrier fence installed along the down gradient perimeter of the existing landfill. Below the silt fence is a depression created by industrial fill. The site is not bordered by a natural stream or waterway; consequently, a natural outlet to a stream is not present. Considering these site surface features, the anticipated extent of surface disturbance and the relatively short construction period, silt fence will provide adequate erosion and sedimentation control. Sediment contaminated with EAF dust collected during landfill reconstruction and contaminated sections of the silt barrier fence will be placed in the landfill before the low permeable cover layer is completed. Contaminated sections of the silt barrier fence will be replaced. Any additional sediment collected after the low permeable layer is installed will be graded and vegetated after permanent vegetation is established.

Erosion of the cover will be controlled by establishing permanent vegetation on the cover. Vegetation will be installed immediately after the cover is installed, weather permitting.

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The erosion potential of the hazardous waste landfill cover was analyzed in accordance with the procedures outlined in the EPA publication "Evaluating Cover Systems for Solid and Hazardous Wastes," September, 1982. The average annual soil loss was found to be 0.5 tons per acre. This is less than the maximum of 2.0 tons per acre recommended in the RCRA Draft Guidance Document "Landfill Design, Liner Systems, and Final Cover."

The amount of dust generated during reconstruction of the landfill and installation of the cover is dependent upon water content of the various materials. If required, the EAF dust, contaminated soils and cover materials will be slightly wetted and/or wind erosion fabric screens will be used during construction. Installation of the low permeability cover layer will eliminate wind erosion of EAF dust and contaminated soils. Permanent control from wind and precipitation erosion consists of establishing a permanent vegetative cover on the landfill and areas disturbed during construction.

#### **Decontamination**

All equipment used to recontour the landfill will be decontaminated before being used for cover installation or before departing the area. Decontamination will be achieved by brushing and scraping to remove and contain any raw EAF dust. Final cleaning will be performed using cloths dampened with water to remove all traces of EAF dust still remaining after brushing and scraping. All material generated during decontamination, including soiled cloths and brushes will be placed in the landfill.

The need for equipment decontamination during cover installation will be minimized by constructing the low permeable soil layer using a clean bulldozer which will operate from the covered areas. Pushing clean low permeable soil ahead of the dozer will preclude the need to decontaminate the dozer which spreads the soil, while not mixing dust into the low permeable soil. The trucks hauling the soil will operate only on already placed soil, thus keeping the trucks clean. In any event, if decontamination is needed during cover installation, it will be accomplished as described previously.

#### **Security**

During closure of the landfill, access to the work area will be restricted to personnel authorized by Steelton Plant's Environment, Safety, and Health Department. Upon completion of closure, the entire permitted industrial waste area will be secured. A security fence will be

installed. Signs will be posted stating that access is restricted to authorized personnel and that the area is a closed hazardous waste management facility. Entrance gate key distribution and accountability will be the responsibility of the Steelton Plant's Protection Department. No vehicles will be permitted on the closed HWM-1 Landfill.

### **SCHEDULE**

Completion of closure is estimated to be achievable within six months of PADER approval of this closure plan subject to weather conditions. A summary of the schedule is as follows:

<u>Activity</u>	<u>Time Required to Complete (Months)</u>
Site Preparation (landfill recontouring)	2
Placement of Cover Materials	2
Vegetation and Completion of Closure	2

### **CLOSURE MANAGEMENT**

The overall responsibility for managing all closure related activities for the HWM-1 Landfill resides with the Steelton Plant. The individual currently responsible is:

Plant Environmental Engineer  
Steelton Rail Products and Pipe Division  
717-986-2454

The Steelton Plant will have inspectors available during closure to assure compliance with the closure plans and construction documents. Copies of this closure plan will be kept at the facility until closure is complete and certified. The Steelton Plant and an independent professional engineer will submit certification that the facility has been closed in accordance with the closure specifications and construction documents.

Within 90 days after closure, the Steelton Plant will submit to the local land authority and the Regional Office of PADER a survey plat indicating the location, dimensions, and the contents of the landfill. This plat will be prepared based on an as-built survey of the closed landfill and

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certified by a registered professional engineer. Permanent survey monuments will be installed for future reference.

The Steelton Plant will also note on the property deed that the land has been used to manage hazardous wastes and the future use of the property is restricted. The proposed property deed notice is shown below.

#### **PROPERTY DEED NOTICE**

Bethlehem proposes to record in the deed to the Steelton facility, upon ownership transfer or facility closure, the notice below:

Pursuant to the provisions of Section 405 of Act Number 1980-97 of the Commonwealth of Pennsylvania (the Solid Waste Management Act) Bethlehem Steel Corporation acknowledges that portions of this property have been used for the disposal of hazardous wastes generated during steelmaking operations, and that those portions are subject to restricted use. A record of the type, location, and quantity of hazardous waste disposed of within the facility has been filed with the two municipalities having jurisdiction over the hazardous waste disposal area, and the Pennsylvania Department of Environmental Resources.

BSC will provide post-closure care for the HWM-1 Landfill for 30 years after completing final closure. Post-closure care will consist of groundwater monitoring and inspection and maintenance of the landfill, security system, and monitoring equipment.

Settlement of the landfill is not anticipated to adversely affect the landfill or the landfill cover. It will be kept to a minimum through proper compaction of the waste during closure.

#### **GROUNDWATER MONITORING**

A post-closure groundwater monitoring plan will be conducted as part of the facility post-closure operations.

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## INSPECTION AND MAINTENANCE

The landfill, including cover, channels, fencing, signs, etc., will be visually inspected quarterly to ensure that the integrity of the site is not disturbed. During each visual inspection, the landfill will be examined for the following items:

1. Breakdown in area security or signs of vandalism to the perimeter fence
2. Signs in place and legible
3. Vegetation failure
4. Surface erosion as evidenced by erosion rills or gullies
5. Presence of deep-rooting species (i.e., trees)
6. Animal burrows
7. Cover subsidence as evidenced by depressions or subsidence cracks
8. Damage to survey monuments
9. Signs of sediment, deposition, sloughage, erosion or hazardous waste material in the channels
10. Monitoring wells integrity

Problems observed during these inspections will be noted on a post-closure inspection checklist. Records of all inspections will be maintained. Corrective action on the deficiencies observed during these inspections will begin within 30 days of the inspection with the exception of revegetation. Revegetation will be undertaken during the next proper growing season. The following maintenance activities will be undertaken as appropriate to abate problems noted during inspections.

1. All acts of vandalism will be repaired and steps taken to increase security.
2. Damaged and illegible signs will be repaired or replaced.
3. Bare areas on the cap will be reseeded and mulched using the same seed and fertilizer mixture applied at final closure.
4. Erosion rills or gullies will be filled with soil, and seeded and mulched using the same seed and fertilizer mixture applied at final closure.
5. Unwanted vegetation (trees, etc.) will be removed manually or by mowing as necessary.
6. Burrowing animals will be trapped or otherwise removed, and their burrows backfilled to the extent practicable by manual methods.

7. Depressions in the cover will be regraded and filled with soil material. It will then be seeded and mulched with the same seed and fertilizer mixture applied at final closure.
8. If a survey monument is damaged it will be resurveyed and reset.
9. Sediment will be removed from the channels as necessary to maintain design capacity. Sidewall sloughage or breaches will be repaired so as to properly redefine the ditch cross sectional shape. Erosion will be repaired as described in maintenance activity 4 of this list. Signs of hazardous waste material will be investigated and corrective action taken.

Records will be kept for all corrective actions done as the result of items noted on the inspection checklist.

Groundwater monitoring wells will be inspected, at the time of sampling. Because the wells are located in a relatively remote area of the plant this frequency is considered adequate. Any well that has collapsed or otherwise become non-functional will be replaced by drilling a new well adjacent to it. The old well then will be sealed by filling with cement grout to the surface.

#### **POST-CLOSURE RESPONSIBILITY**

Post-closure care of the HWM-1 is the responsibility of the Steelton Plant. The individual currently responsible during post-closure care is:

Plant Environmental Engineer  
Steelton Rail Products and Pipe Division  
(717) 986-2454

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**SUMMARY OF CLOSURE ASPECTS OF  
APPROVED CLOSURE PLAN FOR  
AREA NO. 8**

**BETHLEHEM STEEL CORPORATION  
STEELTON PLANT**

*Prepared by*

**BAKER/TSA, INC.  
CORAOPOLIS, PENNSYLVANIA**

**MAY, 1987  
With DER Approved Revisions Subsequent to  
November 1986 and Through  
January 1989**

**312224**

Bethlehem Steel Corporation (BSC) owns and operates the Steelton Plant located approximately one mile south of Harrisburg in Dauphin County, Pennsylvania. The Steelton Plant uses scrap metal to produce steel by the electric arc furnace (EAF) process. EAF dust is generated by three electric arc furnaces located in the steelmaking Melt Shop.

The Steelton Plant currently generates about 9,000 tons of EAF dust per year. Approximately 22,000 tons per year are generated when the plant operates at full capacity.

Based upon available information, EAF dust was deposited in the area designated as Area No. 8 during the period from about 1969 to 1976. The first year corresponds with the installations of the initial furnace (No. 207) in the Melt Shop (May 1969) and No. 1 Baghouse (June 1969). Full-scale production of steel began in 1971 following a lengthy shakedown period. The second year corresponds with the issuance of Pennsylvania Department of Environmental Resources (PADER) Solid Waste Permit No. 300583, a precondition for which was evidently that Area No. 8 be closed (i.e., graded, capped, seeded, and revegetated). During 1976, BSC stopped the placement of EAF dust in Area No. 8, and covered the area with a layer of soil, and subsequently vegetated the soil cover. Plant records indicate seeding occurred September 23, 1976. This plan includes details on the process which resulted in the delineation of the extent of EAF dust in Area No. 8.

After terminating placement of EAF dust in Area No. 8, EAF dust was deposited in an on-site monofill. Effective August 2, 1980, the dust subsequently placed in this monofill became classified as a hazardous waste, i.e., emission control dust/sludge from the electric furnace production of steel (Hazardous Waste No. K061)-see Pennsylvania Bulletin, Vol. 10, No. 31, page 3169, August 2, 1980. Effective November 18-19, 1980, this monofill was regarded as having interim status [see 25 Pennsylvania Code 75.265(2) and RCRA Section 3005 (e)] and was designated as the plant's Hazardous Waste Management Facility No. 1 (HWM-1). BSC stopped placing EAF dust in HWM-1 on December 31, 1985 and submitted a closure plan to PADER for HWM-1 providing for on site closure with a cap acceptable to the PADER and consistent with applicable hazardous waste management regulations.

Area No. 8 is located in Swatara Township entirely within the Steelton Plant's property boundary, adjacent to Steelton's active residual waste landfill. Access to the active residual waste landfill is limited to several entrance gateways, all controlled by Bethlehem Steel Corporation. Area No. 8 consists of a deposit of EAF dust capped by a vegetated layer of low permeability soil. Dust accumulation occurred during the period from about 1969 to 1976.

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Investigations have determined that Area No. 8 contains approximately 38,000 cubic yards of EAF dust within an irregularly shaped 2-acre area. Existing side slopes vary.

The extent of EAF dust deposited in Area No. 8 and the procedures for determining that extent are detailed in a "Report on Determination of Limits of Electric Arc Furnace Dust" for Area No. 8 prepared in February 1987 and revised in April 1987 by Baker/TSA, Inc. This report was submitted on April 15, 1987, to the PADER and contains extensive background information, including field boring records and boring location drawings.

The quantity of EAF dust within Area No. 8 was determined in the following manner. Cross sections were surveyed at significant stations along a site baseline. Stations were judged to be significant if the plane of the cross section passed in close proximity to several borings. Cross sections were plotted, and respective boring depth information was applied to each cross section in order to define the vertical and horizontal limits of the EAF dust. Quantities were computed for the EAF material deposit applying the average end area method to the cross sections.

The extent of the Area No. 8 EAF dust deposit delineates the area occupied by the deposits as ranging in thickness to a maximum of 35 feet.

The Steelton Plant uses scrap to produce steel by the electric arc furnace process. The electric arc furnaces generate particulate emissions during the (1) charging of scrap, (2) tapping of furnaces, (3) pneumatic injection of limestone and burnt lime, (4) oxygen blowing, and (5) melt down/refining periods. This particulate (i.e., EAF dust) is collected in two baghouses.

The average raw chemical composition of the Steelton Plant EAF dust as determined by 62 separate analyses conducted over a six-year period is as follows:

<u>Primary Component</u>	<u>Percent by Dry Weight</u>
Iron	21.5
Calcium Oxide	16.6
Zinc	19.4
Lead	4.23
Cadmium	0.11

The plant's EAF dust physical characteristics, based upon over 15 years of operating experience, are as listed:

- Physical State - Solid
- Average Bulk Density - 65 pounds/cubic foot
- Color - Reddish Brown
- Odor - None
- Free Liquids - None
- Non-ignitable
- Non-corrosive
- Non-reactive

### **CLOSURE ACTIVITIES**

Area No. 8 will be closed as a landfill. Closure activities generally will consist of:

- Initial site preparation to attain suitable slopes for cover placement, including embankment construction,
- Cover installation,
- Runon/runoff control,
- Erosion control,
- Implementation of security measures.

### **Site Preparation**

During site preparation, the site will be cleared, recontoured, and regraded. Recontouring shall consist of placement of embankment adjacent to existing slopes in order to attain a more suitable **slope gradient** for cover placement and also shall consist of removal of the soil stockpile approximately 200' left of Station 0+00. Regrading shall consist of surface preparation of all disturbed areas for seeding and of the remainder of the landfill for cover.

In the course of recontouring and regrading the landfill, after PADER approval of this Closure Plan, embankment material will be compacted to minimize settling. It is anticipated that the small amount of settlement that may occur will not adversely affect the landfill cover.

### Cover Installation

After site preparation is complete, the final cover will be installed and will consist of:

- A one-foot thick layer of low permeability soil  $1 \times 10^{-5}$  cm/sec placed over the entire Area No. 8 landfill.
- A 50 mil geomembrane cover.
- A geonet drainage layer.
- A ten ounce geotextile to prevent clogging of the geonet drainage layer.
- A thirty-inch thick layer of soil placed over the geotextile as a surface cover to promote vegetative growth. (The first six inches may contain stones passing a six inch screen; the balance may contain stones passing a ten inch screen.)
- Permanent vegetation of the final cover to prevent erosion.

Gas vents will not be provided since anaerobic biological production of gas is not expected within Area No. 8 because no organic materials were placed in the landfill.

The landfill cover will be graded to a maximum 4H:1V (25%) slope. Benches will be provided at twenty (20) foot vertical intervals.

The depth of cover material above the low permeability soil material is approximately 30 inches which is equal to the average frost depth at this location. Therefore, frost will not affect the low permeability material or the geomembrane.

An analysis of the proposed final cover design was performed using the EPA "Hydrologic Evaluation of Landfill Performance (HELP) Model" to determine the quantity of water that could be expected to percolate through the cover and the landfill.

Soil parameters (such as field capacity, wilting point, etc.) for the various layers are assumed by the model based on soil texture/grain size and selected permeabilities.

The results from the model conservatively indicate that an average annual total of 1.7 inches of water will percolate from the base of the landfill and the base of the cover. This means that of the more than 43 inches of annual precipitation, less than 5 percent will infiltrate through

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the cover and the waste. This demonstrates that the proposed cover minimizes infiltration and resulting leachate generation.

Runoff from the existing site presently occurs as sheet flow from the top of the existing landfill toward both the south and the north over the existing slope. The work proposed for closure of the Area No. 8 landfill will lessen the steepness of the existing slope and provide an even layered cover to protect the existing material from infiltration of surface water. In general, no appreciable change in the direction or nature of the runoff will occur as a result of closure operations. However, the construction of a bench on the proposed embankment slope will create a collection channel which will convey water along the bench toward the west on a 3% slope. This water will be diverted over the slope via the use of a rock lined drainage channel and will discharge into a runoff collection channel. A riprap flow retardance structure will be constructed at the outlet of the rock lined channel to provide energy dissipation for erosion control. In addition, a drainage swale has been provided at the western end of Area No. 8 to collect and channel surface runoff and runoff from Area No. 8 and the area of the former soil stockpile, respectively.

Due to the relatively small contributing drainage area with resultant design discharge and shallow channel slope, permanent vegetation is sufficient to prevent erosion damage during storm events except where rock lining has been specified.

#### Erosion Control

Area No. 8 is located in an upland area with no natural drainage channels. As discussed previously, closure activities for this site will include embankment construction, regrading, and cover installation. During closure, construction operations will be limited to an area of approximately 4 to 6 acres (Area No. 8 plus soil stockpile areas) and, to minimize erosion, disturbed areas will be vegetated as soon as possible after necessary closure activities are complete. Runoff is expected to occur as sheet flow.

Temporary erosion control for closure will consist of a silt barrier fence installed along the downgradient perimeter of the landfill. Considering the site surface features, the anticipated extent of surface disturbance, and the relatively short construction period, the silt fence will provide adequate erosion and sedimentation control.

Sediment collected during landfill reconstruction will be placed in the landfill before the low permeability cover layer is completed. Damaged sections of the silt barrier fence will be replaced. Any additional sediment collected after the low permeability cover layer is installed will be graded before permanent vegetation is established.

Erosion of the cover will be controlled by establishing permanent vegetation on the cover. Vegetation will be installed immediately after the cover is installed, weather permitting.

The erosion potential of the landfill cover was analyzed in accordance with the procedures outlined in the EPA publication "Evaluating Cover Systems for Solid and Hazardous Waste," September, 1982. The average annual soil loss was found to be 1.2 tons per acre. This is less than the maximum of 2.0 tons per acre recommended in the RCRA Draft Guidance Document, "Landfill Design, Liner Systems, and Final Cover."

The amount of dust generated during reconstruction of the landfill and installation of the cover is dependent upon water content of the various materials. If required, the embankment and cover materials will be slightly wetted, and/or wind erosion fabric screens will be used during construction. Installation of the low permeability cover layer will eliminate wind erosion of embankment material. Permanent protection from wind and precipitation erosion consists of establishing a permanent vegetative cover on the landfill and areas disturbed during construction.

### Security

During closure of the landfill, access to the work area will be restricted to personnel authorized by Steelton Plant's Environment, Safety, and Health Department. Signs will be posted stating that access is restricted to authorized personnel and that the area is a closed waste management facility. Entrance gate key distribution and accountability for the Steelton Plant landfill area will be the responsibility of the Steelton Plant's Protection Department. No vehicles will be permitted on the closed landfill.

### SCHEDULE

Completion of closure is estimated to be achievable within six months of completion of the 4H:1V embankment construction and subsequent initiation of the PADER approved closure plan, subject to weather conditions. A summary of the schedule is as follows:

<u>Activity</u>	<u>Time Required to Complete Following Completion of Embankment Construction (Months)</u>
Site Preparation (landfill recontouring)	2
Placement of Cover Materials	2
Vegetation and Completion of Closure	2

### **CLOSURE MANAGEMENT**

The overall responsibility for managing all closure-related activities for Area No. 8 Landfill resides with the Steelton Plant. The individual currently responsible is:

Plant Environmental Engineer  
Steelton Rail Products and Pipe Division  
717-986-2454

The Steelton Plant will have inspectors available during closure to assure compliance with the Closure Plans and associated specifications and construction documents. Copies of this Closure Plan will be kept at the Steelton Plant until closure is complete and certified. The Steelton Plant and an independent professional engineer will submit certification that Area No. 8 has been closed in accordance with the Closure Plans.

Within 90 days after closure, the Steelton Plant will submit to the local land authority and the Regional Office of PADER a survey plat indicating the location, dimensions, and the contents of the landfill. This plat will be prepared based on an as-built survey of the closed landfill and certified by a registered professional engineer. Permanent survey monuments will be installed for future reference.

The Steelton plant will also note on the property deed that the land has been used to manage industrial waste and the future use of the property is to be appropriately restricted. The proposed property deed notice is shown below.

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## PROPERTY DEED NOTICE

Bethlehem Steel Corporation proposes to record in the deed to the Steelton facility, upon ownership transfer or facility closure, the notice below:

Pursuant to the provisions of Section 405 of Act Number 1980-97 of the Commonwealth of Pennsylvania (the Solid Waste Management Act), Bethlehem Steel Corporation acknowledges that portions of this property have been used for the disposal of industrial wastes generated during steelmaking operations, and that those portions are subject to restricted use. A record of the type, location, and quantity of waste disposed of within the facility has been filed with the Pennsylvania Department of Environmental Resources and the two municipalities having jurisdiction over the waste disposal area.

Groundwater monitoring for Area No. 8 is detailed in a separate report, "Groundwater Monitoring Assessment Plan", which was submitted to the Pennsylvania Department of Environmental Resources in april 1987.

The Area No. 8 groundwater monitoring program was initiated in March 1989. Results from this first quarterly monitoring event and subsequent quarterly events will be submitted to PaDER under separate cover.

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